

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
24 February 2005 (24.02.2005)

PCT

(10) International Publication Number
WO 2005/018104 A1

(51) International Patent Classification⁷: **H04B 1/707**

(21) International Application Number:
PCT/US2003/024527

(22) International Filing Date: 4 August 2003 (04.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant (for all designated States except US): **THOMSON LICENSING S.A. [FR/FR]**; 46, quai A. Le Gallo, F-92648 Boulogne Cedex (FR).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **LITWIN, Louis, Robert** [US/US]; 34-14 Quail Ridge Drive, Plainsboro, NJ 08536 (US). **KOSLOV, Joshua, Lawrence** [US/US]; 10 Fairway Drive, Hopewell, NJ 08525 (US).

(74) Agents: **TRIPOLI, Joseph, S.** et al.; Thomson Licensing Inc., 2 Independence Way, Suite 200, P. O. Box 5312, Princeton, NJ 08543-5312 (US).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

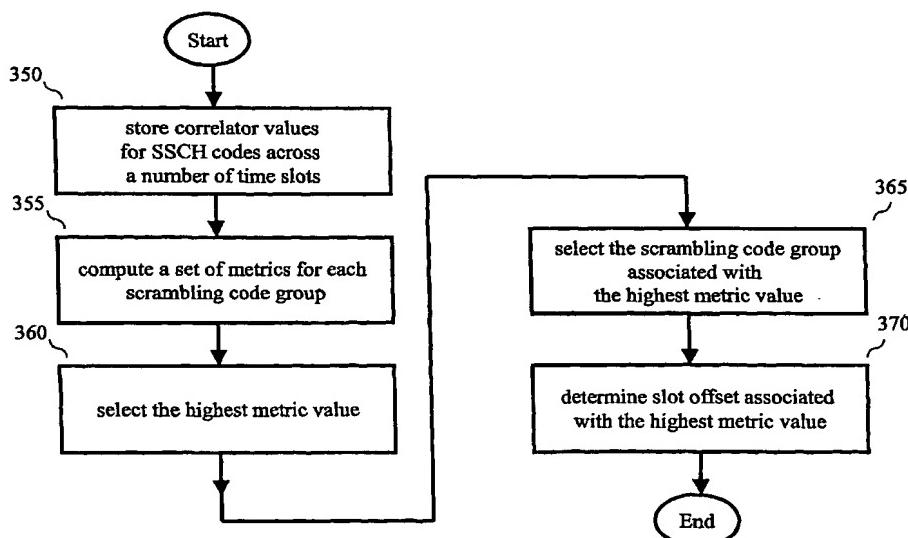
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FRAME SYNCHRONIZATION USING SOFT DECISIONS IN A UNIVERSAL MOBILE TELEPHONE SYSTEM RECEIVER



WO 2005/018104 A1

(57) Abstract: A Universal Mobile Telephone System (UMTS) receiver performs frame synchronization in accordance with a soft decision technique. Illustratively, the UMTS receiver first forms a matrix of correlation peak values (350) from at least one received frame, each row of the matrix representing a possible SSCH code and each column of the matrix representing a slot position of an SCH frame. The UMTS receiver then forms a metric (355) for each cyclic shift of each one of 64 possible scrambling code groups from the matrix of correlation peak values and identifies the metric with the highest value (360). Having identified the highest metric value (360), the UMTS receiver uses the scrambling code group (365) and offset associated thereto (370) to complete frame synchronization.